PATENT

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TRANSPORT, LAUNCH AND RECOVERY CRAFT

This application claims priority based on U.S. Provisional Patent Application Serial No. 60/399,406, entitled "Launch and Recovery Craft Apparatus," and filed July 31, 2002.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a perspective view of one embodiment of a transport, launch and recovery marine craft, shown with a hinged well deck and the stern gate in a lowered position;

Fig. 2 is a perspective view of a trailer mounted Dolphin Class SDV;

Fig. 3 is a top view of one embodiment of the craft, showing a SDV loaded within the hinged well deck, with both the well deck and the stern gate raised;

Fig. 4 is a side view of one embodiment of the craft, with the hinged well deck in a raised position and the stern gate lowered;

Fig. 5 is a rear view of one embodiment of the craft, showing the well deck in a raised position and the stern gate lowered; and

Fig. 6 is a side view with a partial sectional view of one embodiment of the craft, with both the well deck and the tern gate in a lowered position.

These drawings are provided for illustrative purposes only and should not be used to unduly limit the scope of the present invention.

DETAILED DESCRIPTION OF EMBODIMENTS OF THE INVENTION

The marine craft **100** of the present invention is designed to transport, deploy and retrieve cargo **110**. In one embodiment, the cargo **110** comprises a marine vessel distinct from the craft **100**. In other embodiments, such marine vessel is submersible and can navigate similar to a small submarine. In yet other embodiments, the marine vessel cargo **110** comprises a Dolphin Class swimmer delivery vehicle (SDV).

The craft **100** in one embodiment provides the capability for rapid transport of SDVs **110** in both training and operational scenarios. In other embodiments, the craft can deploy a SDV having a crew of up to eight personnel and their equipment. In yet other embodiments, the craft **100** has a fully loaded cruise speed of up to 26 knots, carries 1,000 gallons of diesel fuel and has a cruising range of 500 nautical miles. In yet other embodiments, the craft **100** provides fast, long-range, inconspicuous transportation of SDVs.

The craft **100** comprises several standard components for a seaworthy vessel, including a hull **20**, a bow **21** and a stern **25**, and selectively including a fore deck **22** and a cabin **24**. The embodiments of the craft **100** further comprise components for transporting, deploying and retrieving cargo **110**, for example, a

SDV. In one embodiment, the craft **100** comprises an open hull portion **31** at the stern **25**. In other embodiments, the open hull portion **31** is defined by a pair of spaced apart buoyant structures **26**, **28** that extend rearwardly from the bow **21** of the craft **100** at laterally opposite sides thereof. The stern **25** has an open end **29** for ingress and egress of cargo floating in the water to and from the open hull portion **31**. A well deck **30** is secured within the open hull portion **31**. In yet other embodiments, the well deck **30** is configured to receive and support various cargo **110** therein, for example, a SDV. The hull **20** is suitably configured for travel though water. In one embodiment, the hull **20** is configured for rapid travel through water.

The well deck **30** is hinged at a connected end **34** to a transverse portion of the hull generally adjacent the open hull portion **31**. The well deck **30** in one embodiment includes upstanding wall **32** and sidewalls **36**, **38**, which may be connected at their respective intersections. The upstanding wall **32** extends from the connected end **34**, and the upstanding sidewalls **36, 38** extend from laterally opposite sides of the well deck that connect the connected end **34** and the stern end **35**. The well deck **30** is configured to fit within the open hull portion **31**.

In one embodiment, the well deck **30** has a hinged stern gate **39** which selectively raises and lowers by any known means. The stern gate **39** is located at a stern end **35** of the well deck **30** and is generally positioned at the open end **29** of the open hull portion **31**. The stern gate **39** raises and lowers about its hinged securement in order to open and close access to the well deck **30** and to aid in

retaining cargo **110**, for example, a SDV, within the well deck **30**. In yet other embodiments, the well deck **30** further comprises an upwardly facing bottom surface **33** for supporting cargo **110** received within the well deck **30**.

In one embodiment, the well deck **30** further comprises a cradle (not shown) with damped, flexible mounts (not shown) secured to the bottom surface **33** for mitigating shock loads imparted on the cargo **110** during high-speed transit.

Means is generally provided on the craft **100** for selectively raising and lowering the stern end of the well deck **30** relative to the connected end **34**. In one embodiment, when the well deck **30** is in a raised position, as shown in FIGS. 3, 4 and 5, the exterior bottom of the well deck **30** is substantially aligned with the exterior surface of the hull **20** such that the hull generally appears as a contiguous piece from bow **21** to stern **25**. In other embodiments, the exterior bottom of the well deck **30** in a raised position matches the exterior bottoms of the buoyant structures **26, 28** to provide the appearance and functionality of a single shell hull.

In one embodiment, the raising and lowering means comprises hydraulic or pneumatic cylinders **58** extending between a raised, overhead support **50** and the well deck **30**. The overhead support **50** extends between the buoyant structures **26, 28** in proximity to the stern **25** of the craft **100**. The overhead support **50** includes a first upright portion **52**, a second upright portion **54**, and a structural bridge **56** extending therebetween. More than one raised overhead support **50** may be used, as shown in FIGS. 3, 4 and 6.

The cylinders **58** are connected in one embodiment at an upper end **57** thereof to the structural bridge **56** and at a lower end **59** thereof to the upper edge of the upstanding sidewalls **36**, **38** of the bottom well deck **30**, as shown in FIG. 1. In other embodiments, the lower end **59** of each cylinder **58** may be connected directly to the bottom surface **33** of the well deck **30** as shown in FIG. 5 and FIG. 6.

In one embodiment, the cylinders **58** lower the well deck **30** about the connected end **34** into a lowered position as shown in FIG. 1 and FIG. 6 for ease of selectively deploying and retrieving cargo **110**, for example, a SDV.

In one embodiment, a suitable winch **60** located in a forward portion of the craft **100** adjacent the open hull portion **31** is used to retract a cable **62** connected between the craft **100** and the cargo **110**, to pull the cargo into the well deck **30**. In other embodiments, the winch **60** and cable **62** further aid in securing the cargo **110** within the well deck **30**.

When floating cargo **110**, such as a SDV, is retrieved from the water and secured within the well deck **30**, the cargo is positioned for transport by raising the well deck **30** about the connected end **34** with cylinders **58**, as shown in FIG. 3 and FIG. 4. In one embodiment, the winch **60** is alternatively used to extend the cable **62** to deploy the cargo **110** from the craft **100**, when the well deck **30** is lowered into a lowered position as shown in FIG. 1 and FIG. 6.

Cargo **110** may be loaded within the well deck **30** upon damped, flexible mounts (not shown) provided in the well deck **30**. In one embodiment, the cargo

110, once loaded, is secured in place with a suitable releasable fastening means **70**, such as straps, clamps, line, cord, cable, etc.

In one embodiment, a suitable cover (not shown) is used to cover the cargo when the craft **100** is underway. The cover may be a soft top, canvas, or tarp, which completely covers the open hull portion **31** and the cargo.

In one embodiment, the craft **100** is manufactured at least in part of fiberglass and/or aluminum or other materials suitable for a marine craft and for light weight, corrosion resistance and structural strength.

In one embodiment, the craft **100** is powered by at least one engine (not shown) coupled to one or more jet drives **80**. In other embodiments, the engines are six cylinder in-line diesel engines rated at about 420 bhp each. In yet other embodiments, the craft **100** has a fuel capacity of about 1,000 gallons. In yet other embodiments, the engines will provide a fully loaded cruising range of 500 nautical miles.

In one embodiment, the craft **100** is fitted with a plurality of hard points (not shown) that enable the craft **100** to be lifted by a larger ship's crane (not shown), and deployed into the water with cargo pre-loaded in the well deck **30**.

The scope of the prevent invention is not strictly limited to the specific embodiments disclosed herein. The invention may be practiced by one skilled in this art by utilizing numerous features and adaptations practiced in the art. Such features and adaptations are intended to be included within the scope of this disclosure, and the accompanying claims.